THE OFFICE OF THE STATE CHIEF INFORMATION OFFICER
ENTERPRISE TECHNOLOGY STRATEGIES

North Carolina Statewide Technical Architecture

Enterprise Management Domain

Enterprise Management Domain

Initial Release Date:	September 11, 2003	Version:	1.0.0
Revision Approved Date:			
Date of Last Review:	March 17, 2004	Version:	1.0.1
Date Retired:			
Architecture Interdependencies:			
Reviewer Notes: Reviewed and updated office title and copyright date. Added a hyperlink for the ETS email – March 17, 2004.			

Office of the State Chief Information Officer
Enterprise Technology Strategies
PO Box 17209
Raleigh, North Carolina 27699-7209
Telephone (919) 981-5510
ets@ncmail.net

Enterprise Management - Enterprise Management Architecture

Principle 8.00.02 Organizations should limit the number of permutations in products to facilitate support efforts and reduce long term support costs.

Rationale:

Uncontrolled product deployment contributes to a level of complexity that exceeds the support capability of current distributed systems management, DSM, tools and increases staff and training costs. Choices for managing this difficult situation include:

- Scaling back deployment to a manageable range.
- Reducing complexity through consistent product selection.
- Planned retirement of applications, hardware and operating systems with performance problems and/or that are difficult or impossible manage and support.
- Deployment of consistent environments enables the systems management infrastructure to adjust to change. For example, when all users of a particular system have a recommended standard desktop software configuration, this common basic environment makes it easier to plan and install system upgrades and to isolate problems.
- A finite and identifiable product universe facilitates centralized support and planned operational changes.
- Careful selection of products that can be supported centrally is more cost effective because it reduces the support burden of `shadow' or peer to peer support. Support costs are one of the most expensive systems management components.
- Established product selection criteria contributes to cost savings through discounts provided for state-wide software product licenses. Business managers need to be aware of the impact that business decisions have on support costs.
- The learning curve and associated training costs for technical staff are reduced when products are carefully selected to comply with architectural requirements.

Enterprise Management - Enterprise Management Architecture

Principle 8.00.03 Limit the amount of "unique" performance tuning to existing individual network components, particularly servers and desktops.

Rationale:

- Performance tuning for unique/non-standard components is not worth the increased maintenance costs of multiple configurations.
- Performance tuning can inhibit change by encouraging comfort with the status quo.
- It may be cheaper to increase performance by upgrading to an architecturally compliant hardware configuration than to spend time tuning an application.

Enterprise Management - Enterprise Management Architecture

Principle 8.00.04 Increase capital investment when it offsets long-term support costs.

Rationale:

- Identical configurations are easier to support. In the long term it may be much more expensive to support multiple types of configurations than it is to invest in replacing them with consistent configurations.

- Purchasing hardware that exceeds the immediate need often saves money in the long run, as it promotes expandable systems and reduces the need for tuning and support.
- It is more cost effective to use capital dollars to improve operations than to spend support dollars on outmoded technology. The cost of continuing to support an aged configuration is often higher than the cost of new equipment that will improve performance and reduce support costs.
- The practice of using "hand-me-down" equipment perpetuates obsolete technology and can greatly increase the support burden by increasing the number and kind of devices requiring support and its associated costs.

Enterprise Management - Enterprise Management Architecture

Principle 8.00.05 Utilize open, vendor-neutral standards whenever possible.

Rationale:

- Open, vendor-neutral systems standards provide flexibility and consistency that will allow agencies to respond more quickly to changing business requirements.
- Vendor-neutral systems support economic and implementation flexibility.
- Vendor-neutral systems also protect the state against unexpected changes in vendor strategies and capabilities.

Enterprise Management - Help Desk

Best Practice 8.01.01 The help desk and user support functions must be re-engineered to provide an integrated support services environment.

Rationale:

- The central help desk provides the focal point to mediate problems.
- Support tools should empower both the help desk analyst and the end user with self-help capabilities.

Enterprise Management - Help Desk

Best Practice 8.01.02 The help desk should actively work to improve the perception of its services within the organization.

Rationale:

- Help desk analysts must be empowered to take ownership of problems and given the tools to solve them.
- As part of managing the changing perception of the help desk organization, marketing events, such as newsletters, should target the end-user community as well as their managers.
- Upper management should periodically work on the help desk to demonstrate commitment to service and gain greater appreciation for user needs.
- Training for end users should be included in all help desk improvement plans.

Enterprise Management - Help Desk

Best Practice 8.01.03 In order to provide the best customer service environment, it may be necessary to elevate and/or restructure the help desk within the organization.

Rationale:

- The help desk organization should be elevated in the organizational and reporting structure to operate independently of other units, making customer service needs its top priority.
- The role of the help desk analyst is changing. Help desk staff should serve on project teams, and participate in training, application design, testing, and maintenance.
- All requests for service should be channeled through the help desk when feasible.

Enterprise Management - Help Desk

Best Practice 8.01.04 A single consolidated help desk design supports an enterprise model.

Rationale:

- A consolidated help desk does not have to be physically located in one place. However, it should have one constituency, one phone number, one set of procedures, one set of defined services, and one set of integrated network systems management (NSM) platforms and applications.
- The implementation of the virtual data center (VDC), where many remote LANs are managed as a single entity, supports the corresponding development of consolidated help desk services.

Enterprise Management - Help Desk

Best Practice 8.01.05 Each centralized help desk unit must provide a single point of contact (SPOC).

Rationale:

- A SPOC minimizes user inconvenience and confusion. In its broadest sense, SPOC means that the end user makes one attempt at contact and the help desk request is channeled by some automated means to the organization that can best service the request.
- The help desk should mediate all problems.

Enterprise Management - Help Desk

Best Practice 8.01.06 In order to leverage support resources and provide effective client support, multiple tiers or levels of client support are required.

Rationale:

- Tier/Level 1 client support should have end-to-end responsibility for each client request. The help desk analyst should be empowered to resolve as many requests as possible. Tier 1 provides the client contact point (CCP) or call ownership, which is the single point of contact for the end user to request a service. Organizations should retain control of the Tier 1 help desk in order to ensure the quality of the customer relationship.
- Tier/Level 2 client support provides advanced technical expertise to the tier/level 1 client contact points. Their responsibility is to analyze the requests routed to them and resolve the problems. Resources at this level can be composed of staff specialists and/or third party providers/vendors.

- Tier/Level 3 support is composed of highly specialized technical experts. Calls which cannot be solved at tiers/levels 1 and 2 are routed to this level. Resources at this level can be composed of staff specialists and/or third-party providers/vendors.

Enterprise Management - Help Desk

Best Practice 8.01.07 Reliable metrics and reports must be defined and used to assist managers, help desk staff, and the client community to assess the effectiveness of the help desk in meeting organizational goals.

Rationale:

- Both consolidated high level and low level detailed measures are critical to successful service desk operations.
- Metrics should be used to identify trends and to support a proactive management approach that anticipates and avoids problems.
- Monitoring server information and trend analysis of performance statistics for comparing LAN operations generates important information necessary to remotely support many LANs.
- Methods and procedures to solve problems should be developed, published and followed and measured.
- Service level agreements (SLA's) should be developed stating responsibilities of both the help desk and its clients. SLA criteria are one method to evaluate help desk performance.

Enterprise Management - Help Desk

Best Practice 8.01.08 Geographically dispersed help desk units must inter-operate and share information.

Rationale:

- All requests for service should reside in a database that is shared by technology and application-based help desk units serving specific constituencies throughout the state. This process shares information and makes it possible for one help desk to electronically pass a service request to another help desk without forcing the user to make another contact attempt.
- The use of technological advances, such as distributed processing, dynamic control of users desktop, improved telephony, and client support software, make it possible for geographically dispersed help desk groups to function as a cohesive support unit.

Enterprise Management - Help Desk

Best Practice 8.01.09 Resolution databases that contain solutions to recurring problems should be built to improve service quality and contain costs.

Rationale:

- Building and using a knowledge base of prior resolutions to solve problems improves the quality of resolutions.
- Help desk operations should include problem resolution links to external systems.

Enterprise Management - Help Desk

Best Practice 8.01.10 The help desk should maintain Inventories of hardware and software configurations. They should include all physical components (processor, RAM, disk drive, network cards, add-on cards) and other types of relevant information.

Rationale:

- Current inventories are critical to support functions.
- Inventory "agents" or applications that survey and record current inventory facilitate collection from desktops and servers.

Enterprise Management - Operations Management

Best Practice 8.02.01 Equipment deployed in virtual data centers must be configured to facilitate remote management and support.

Rationale:

- The VDC should be configured to prevent a single point of failure.
- Identical configurations of rack-mounted servers are placed in secure locations (closets).
- For reliability and ease of support, each major application should be placed on a uniformly configured server. This may require that each major application be implemented on its own server. (See the Platform Domain.)
- Use the same reference configuration on these servers. Important items to consider when planning for consistency include using the same versions of network software, using the same network hardware cards, etc. (See the Platform Domain.)
- Systems management tools, consistently applied, allow management of multiple instances of the identical network configurations at remote sites as if they were on the data center floor.
- The VDC should support mission critical applications.

Enterprise Management - Operations Management

Standard 8.02.01 Use SNMPv1 (simply called SNMP) protocols.

Rationale:

- The Simple Network Management Protocol (SNMP) is a group of internet protocols that is the standard for managing TCP/IP based networks.
- It is built into the devices (e.g., concentrators, routers) in the network and in the network operating systems of the servers and workstations.
- The network management system uses SNMP to collect statistics and other information on network devices.
- SNMP is also used to send commands that control the state of network devices.
- In 1993, SNMPv2 attempted to address security and control issues, however there were inter-operability issues between SNMPv1 and SNMPv2. It is extremely difficult to find an SNMPv2 manager, therefore SNMPv2 has not been accepted and is widely considered a failure.

Enterprise Management - Operations Management

Best Practice 8.02.02 Systems management functions for the virtual data centers should be remotely performed.

Rationale:

Some examples of remote systems management services include:

- Backup, archiving and recovery
- System, database and application monitoring
- Software distribution to the server and/or desktop

Enterprise Management - Operations Management

Standard 8.02.02 Use Remote Monitoring (RMON) products.

Rationale:

- RMON products are predicted to become increasingly used in most enterprise networks.
- RMON products provide packet collection, decoding and analysis to the MAC layer of the Operating Systems Interconnection (OSI) stack using a combination of consoles and hardware and software probes that relied on SNMP MIB data collections.
- In 1992, the Internet Engineering Task Force, IETF, specified the RMON1 standard in RCF 1271. The RMON1 MIB extends SNMP capability by monitoring sub-network operation and reducing the data collection burden on management consoles and network agents.
- The RMON2 standard was approved by the IETF in January 1997 in RCF2021. RMON2 includes a new MIB to extend network monitoring into the application monitoring layer.
- RMON functionality is growing to include functions like applications monitoring, report generation and bandwidth allocation.
- All major network device vendors have added RMON MIB collection capability to their products, although the depth of implementation relative to the full RMON specification varies among vendors and products.

Enterprise Management - Operations Management

Standard 8.02.03 Conform to the Desktop Management Interface (DMI) standard.

Rationale:

- The DMI standard was developed by the Desk Top Management Task Force (DMTF), which sets specifications for the management of the desktop environment.
- The DMI is a set of API's that allow different vendor applications to consistently share the desktop.
- It sets the standard for a management platform that enables a common standardized mechanism for systems management of the desktop while permitting vendor differentiation.
- As vendors build desktops with embedded DMI standards, important desktop management information will become available from the newer desktop units.

Enterprise Management - Operations Management

Best Practice 8.02.03 Under the Virtual Data Center concept, responsibilities of customers for systems management are limited.

Rationale:

- Even though the equipment is located close to the customer community, for the most part, local user efforts should be concentrated on performing their business functions rather than on system management tasks such as system configuration, debugging and/or backup.

Enterprise Management - Operations Management

Best Practice 8.02.04 System components should proactively alert in advance of failure including predictive capability.

Rationale:

System generated alarms and alerts should be automatically routed to the appropriate systems management resource. For example:

- Database problems should be routed to the database support group.
- PC hardware problems should be routed to PC support.
- Agents should be able to issue alerts for both hardware and applications.

Enterprise Management - Operations Management

Best Practice 8.02.05 Inventories of hardware and software configurations should be maintained real-time.

Rationale:

- Inventories of configurations are critical to support functions
- Inventory capability requires `agents' on workstations and servers.